



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/576,248	04/18/2006	Yuji Shinohara	127713	2140
27049 7590 08/06/2010 OLIFF & BERRIDGE, PLC P.O. BOX 320850 ALEXANDRIA, VA 22320-4850				
EXAMINER				
BOHATY, ANDREW K				
ART UNIT		PAPER NUMBER		
1786				
NOTIFICATION DATE		DELIVERY MODE		
08/06/2010		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

OfficeAction27049@oliff.com

jarnstrong@oliff.com

Office Action Summary

Application No.

10/576,248

Applicant(s)

SHINOHARA ET AL.

Examiner

Andrew K. Bohaty

Art Unit

1786

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 July 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-11, 13-15, 27, 28 and 30-32 is/are pending in the application.
- 4a) Of the above claim(s) 14, 15, 31 and 32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-11, 13, 27, 28, and 30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. This Office action is in response to the amendment filed July 13, 2010, which amends claims 9-11, 13-15, 27, 28, and 30-32 and cancels claims 1, 2, 5-8, 16-21, 23, 26, and 33-36. Claims 9-11, 13-15, 27, 28, and 30-32 are pending, where claims 14, 15, 31, and 32 are withdrawn from consideration.

Response to Amendment

2. The applicant's amendment to the claims and cancellation of the claims, filed July 13, 2010, has overcome the rejection of claims 1, 2, 5-11, 13, 16-21, 23, 26-28, 20, and 33-36 under 35 U.S.C. 102(b) as being anticipated by Enomota et al (KR 2003/078731) as set forth in the Office action mailed April 15, 2010.

Response to Arguments

3. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

4. The amendment to the claims necessitated the new grounds of rejection. The arguments presented are directed to the deficiencies of the old rejection in relation to the newly amended claims.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 9-11, 13, 27, 28, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Enomoto et al (KR 2003/078731), where Naito et al. (US

2004/0018386) (hereafter "Naito") is a patent family member was will be used as the English translation, in view of Chen et al. (US 6,127,693) (hereafter "Chen") and Murasko et al (US 2003/0032361) (hereafter "Murasko").

8. Regarding claims 9-11, 13, 27, 28, and 30, Naito discloses a hole transport material (paragraphs [0010] and [0100], poly(3,4-ethylenedioxythiophene/styrenesulfonic acid) (PEDOT.PSS)) having the function of transporting holes in an organic EL device (paragraph [0010]) (Naito discloses the material as a hole injection layer, but the layer transport holes from the anode into the emission layer), wherein the material is dissolved in a solvent to make a 0.4 - 2.8 wt% solution (paragraph [0084]) and is purified using ultrafiltration with a membrane filter with a molecular weight cutoff between 8,000-25,000 to remove low molecular weight molecules (paragraph [0081]) (This means molecular weights smaller than these value will be removed from the

polymer during ultrafiltration). This means impurities having a molecular weight of 5,000 or less will be removed during the purification process. This purification method is similar as the method disclosed by the applicants in the specification, with the only difference being of the membrane filter. Naito teaches the use of a larger molecular weight cutoff filter. This means that not only are the 5,000 molecular weight materials removed from the solution (as taught by the applicants), but larger impurities/compounds are removed as well. Therefore, the amount of the 5,000 molecular weight or less impurities found in Naito will be the same as the applicants. Also, the claim is a product by process; therefore, if the product made using both process are the same, which is the case here, then the process used does not have to be the same. Since both Naito and the applicant use ultrafiltration and have a final concentration of 2.0 wt%, the process of getting to the 2.0 wt% does not matter.

9. Further both the applicants and Naito teach the purification of the same material, PEDOT.PSS (Baytron), and both get the material from the manufacturer place Bayer Co.; therefore, the materials would have been synthesized in the same manner and hole transporting materials will contain the same impurities, such as ethylene glycol, sulfate ions, formate ions, oxalate ions, acetate ions, Na ions, Ma ions, K ions, Ca ions, Cr ions Mn, ions, Fe ions, Ni ions, Zn ions, and Sr ions.

10. Although Naito does not teach all the different impurities, such as ethylene glycol, sulfate ions, formate ions, oxalate ions, acetate ions, Na ions, Ma ions, K ions, Ca ions, Cr ions Mn, ions, Fe ions, Ni ions, Zn ions, and Sr ions, that the applicants claims are

present, the material used by Naito will contain all the same impurities since the materials are the same and are both obtained from the same manufacturer.

11. Even though Naito teaches the use of a larger molecular weight cutoff filter, the lower molecular weight compounds of 5,000 or less will still be removed in the same amount as in the applicants' disclosure since both methods utilize ultrafiltration; therefore, the amount of the impurities in the Naito's and the applicants' solutions will be the same.

12. Since Naito uses similar purification technique as the applicants and use the same material as the applicants (from the same location) the purified material of Naito will have the same properties (i.e. the kinds of impurities and amount of the impurities) as the applicants' solutions containing the purified PEDOT:PSS; therefore, Naito anticipates, all of the applicants' claims and will have all the inherent properties of the solutions (as found in claims 9-11).

13. Naito teaches the light emitting device comprises an anode, a cathode, a hole transporting material, and a light emitting layer (paragraph [0031]). Naito teaches the light emitting layer can comprise any color light emitting polymer (paragraph [0031]).

14. Naito does not teach where the light emitting device comprises an electron transporting layer and where the luminescence layer is composed of poly(9,9-dioctyl-2,7-divinylene-fluorenyl-alt-co(anthracene-9,10-diyl)).

15. Chen teaches a polymer light emitting device comprising a polymer light emitting layer and a hole transporting layer (Fig. 6). Chen teaches that the polymer light emitting device can further comprise an electron transporting layer (column 5 lines 37-51). Chen

teaches that the addition of the electron transporting layer improves the turn-on voltage, operating voltage, emission efficiency and stability of the device (column 5 lines 37-51).

16. Murasko teaches an electroluminescent device comprising a polymer light emitting material (paragraph [0002]). Murasko teaches that the light emitting polymer can be poly(9,9-dioctyl-2,7-divinylene fluorenyl-alt-co(anthracene-9,10-diyl) (paragraph [0025]).

17. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the light emitting device of Naito to include an electron transporting layer and substitute the polymeric luminescent material of Naito for poly(9,9-dioctyl-2,7-divinylene fluorenyl-alt-co(anthracene-9,10-diyl) as taught by Murasko to give a light emitting layer laminated in the following order: an anode, a hole transporting layer, a luminescent layer, an electron transporting layer, and a cathode. The substitution would have been one polymeric luminescent material for another polymeric luminescent material with the expected results of using poly(9,9-dioctyl-2,7-divinylene fluorenyl-alt-co(anthracene-9,10-diyl) as a polymeric luminescent material in a light emitting device. The motivation to add the electron transporting layer between the cathode and the luminescent layer would have been to improve the turn-on voltage, operating voltage, emission efficiency and stability of the device.

18. Furthermore, Naito teaches that low molecular weight solid components are not good when found in the hole injection layer of an organic light emitting device and the amount of these materials should be reduced as much as possible (paragraphs [0006]-

[0009]) . It is well known that low molecular weight solid components are bad and there is legal precedent, that purer forms of known products may be patentable, but the mere purity of a product, by itself, does not render the product unobvious, *Ex parte Gray*, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989). Since the applicants do not provide any secondary evidence of unexpected results for the purified polymer and claim a purer form of a known product, the claims are not unobvious over the prior art and are not patentable.

Conclusion

19. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

20. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew K. Bohaty whose telephone number is (571)270-1148. The examiner can normally be reached on Monday through Thursday 7:30 am to 5:00 pm EST and every other Friday from 7:30 am to 4 pm EST.
22. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, D. Lawrence Tarazano can be reached on (571)272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.
23. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. K. B./
Andrew K. Bohaty
Patent Examiner, Art Unit 1786

/D. Lawrence Tarazano/
Supervisory Patent Examiner, Art
Unit 1786